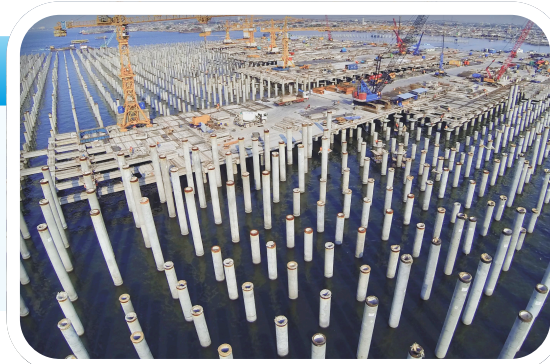




PC PILES

DESCRIPTION

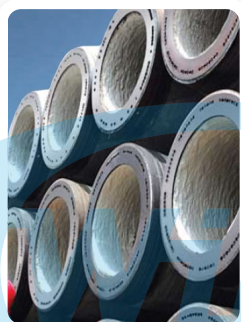
WIKABeton PC Pile products have various cross-sections, namely PC/PHC Spun Piles, PC Spun Square Piles, PC Square Piles, PC Cylinder Piles, and PC Triangular Piles. There are two production systems for WIKABeton PC Pile products: the non-spinning process (for PC Square Piles and PC Triangular Piles) and the spinning process (for PC Spun Piles, PC Spun Square Piles, and Cylinder Piles).

The combination of high-quality concrete with the spinning process results in high concrete density due to centrifugal force. This process makes WIKABeton PC Piles highly durable and permeable, allowing them to withstand special environmental conditions. The development of PC Spun Square Piles, also produced by the spinning process, offers the advantage of having a surface perimeter equivalent to that of PC Square Piles but using less material, making the product lighter and more cost-efficient compared to PC Square Piles.

The latest product in the PC Pile line is the Cylinder Pile. The Cylinder Pile is a large-diameter (up to 2 meters) PC Spun piles with adjustable lengths up to 60 meters. The Cylinder Pile consists of several segments assembled into a single pile using a prestressed system. Typically, this product is used in coastal areas as foundations for piers, breakwaters, or sea walls.

Type of Piles

- PC/PHC Spun Piles
- PC Spun Square Piles
- PC Square Piles
- PC Triangular Piles
- PC Cylinder Piles



Joint System

Welding at steel joint plate

Type of Shoe

Concrete Pencil Shoe (Standard) for PC Spun Piles, Spun Square Piles & Square Piles
Mamira Shoe or Cross Fin Shoe (Special Order) for Spun Piles

Method of Driving

Dynamic Pile Driving : Diesel Hammer and Hydraulic Hammer
Static Pile Driving : Hydraulic Static Pile Driver (Jacking Pile)
Inner Bore System

DESIGN REFERENCE

Design

SNI 6880	Structural Concrete Specification
ACI 543R*	Design, Manufactured and Installation of Concrete Piles
SNI 2847	Indonesian Concrete Code for Concrete
SNI 9156	Specification for Prestressed Concrete Spun Piles



Registration number
S-P-13859

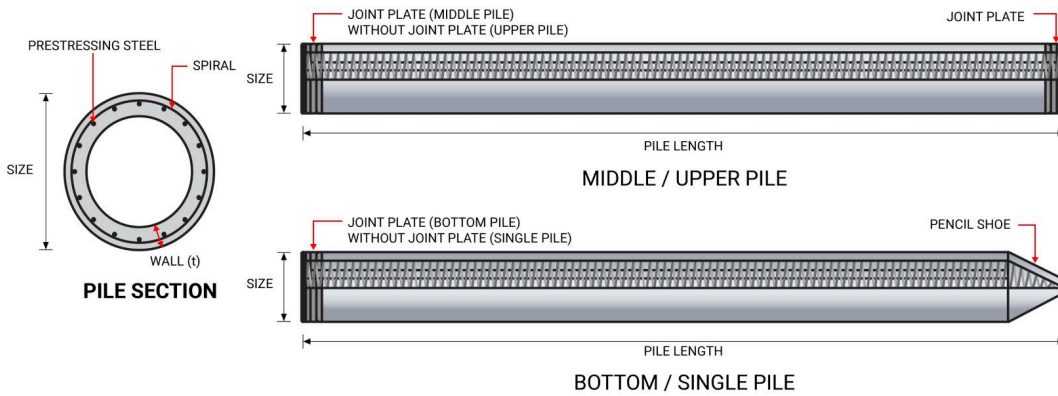
Green Concrete Mix design effect to Reduce CO₂ Emission

▶ PC Spun Piles

Diameter Pile (mm)	300	350	400	450	500	600	800	1000	1200
Concrete Type	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green
Concrete Volume (m ³ /m)	0.045	0.058	0.077	0.093	0.116	0.157	0.256	0.378	0.495
CO ₂ Emissions (t/m)	8.4 7.2	13.9 11.9	24 20.6	35.4 30.4	55.1 47.2	101.1 86.6	269.3 230.7	586.2 502.4	1003.1 859.6
CO ₂ reduction rate kg CO ₂ eq. /m ton CO ₂ eq. /12m (%)	1.2 0.01 ▲14.3	2.0 0.02 ▲14.3	3.4 0.04 ▲14.3	5.1 0.06 ▲14.3	7.9 0.09 ▲14.3	14.5 0.17 ▲14.3	38.5 0.46 ▲14.3	83.8 1.01 ▲14.3	143.5 1.72 ▲14.3

PRODUCT SHAPE

► PC / PHC Spun Piles



▲ SCAN ME

PILE DIAGRAM INTERACTION LINK :
<https://www.wika-beton.co.id/engineering>

SPECIFICATION

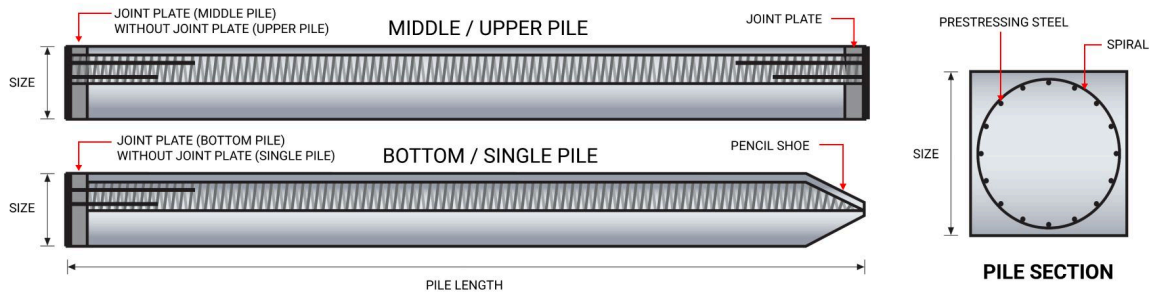
[3] Concrete Compressive Strength : PC Spun Pile : $f_c' = 52 \text{ MPa}$
 PHC Spun Pile : $f_c' = 80 \text{ MPa}$

Size (mm)	Thickness Wall (mm)	Cross Section (cm ²)	Unit Weight (kg/m)	SNI 9156 : 2023				JIS A 5335 : 1987			Allowable Compression			Length of Pile ⁽²⁾ (m)
				Class	Effective Prestress (MPa)	Bending Moment Crack (kN.m)	Nominal (kN.m)	Class	Bending Moment Crack (kN.m)	Break (kN.m)	PC-52 (kN)	PHC-80 (kN)	Decomp. Tension (kN)	
300	60	452	113	A1	4,89	24,5	39,9	A2	24,5	36,8	717	1120	221	6 - 13
				A2	6,37	26,9	50,6	-	-	-	698	1100	288	6 - 13
				A3	7,75	29,4	60,4	A3	29,4	44,1	681	1090	351	6 - 13
				B	9,06	34,3	69,3	B	34,3	61,8	665	1070	410	6 - 15
				C	11,45	39,2	83,8	C	39,2	78,4	636	1040	518	6 - 15
350	65	582	145	A1	3,87	34,3	48,8	A1	34,3	51,5	937	1460	225	6 - 13
				A2	5,06	39,2	62,2	-	-	-	919	1440	294	6 - 13
				A3	7,3	44,1	86,8	A3	41,2	61,8	884	1410	425	6 - 13
				B	8,34	49,0	97,8	B	49,0	88,3	867	1390	485	6 - 16
				C	10,84	58,9	121,7	C	58,8	117,7	828	1340	631	6 - 16
400	75	766	191	A1	3,92	44,1	73,8	-	-	-	1233	1930	300	6 - 13
				A2	4,82	54,0	89,4	A2	53,9	80,9	1214	1910	369	6 - 13
				A3	6,56	63,8	118,2	A3	63,7	95,6	1178	1870	502	6 - 13
				B	8,95	73,6	155,7	B	73,5	132,4	1128	1810	685	6 - 17
				C	10,96	88,3	183,8	C	88,3	176,5	1087	1770	839	6 - 17
450	80	930	232	A1	4,02	73,6	110,9	A1	73,5	110,3	1494	2340	374	6 - 15
				A2	5,5	83,4	139,1	A2	83,4	125,0	1457	2300	511	6 - 15
				A3	7,58	98,1	186,3	A3	98,1	147,1	1405	2240	705	6 - 15
				B	8,87	107,9	214,1	B	107,9	194,2	1373	2210	825	6 - 18
				C	11,22	122,6	260,0	C	122,6	245,2	1314	2140	1043	6 - 18
500	90	1.159	290	A1	4,49	103,0	159,9	A1	103,0	154,4	1848	2900	521	6 - 16
				A2	6,23	122,6	216,2	A2	122,6	183,9	1794	2840	722	6 - 16
				A3	7,33	137,3	250,9	A3	137,3	205,9	1759	2800	850	6 - 16
				B	8,38	147,2	283,0	B	147,1	264,8	1726	2770	971	6 - 19
				C	10,89	166,8	353,5	C	166,7	333,4	1648	2680	1262	6 - 19
600	100	1.571	393	A1	4,28	166,8	251,4	A1	166,7	250,1	2514	3940	672	6 - 17
				A2	5,15	186,4	298,2	A2	186,3	279,5	2476	3900	809	6 - 17
				A3	7,23	215,8	409,7	A3	215,7	323,6	2388	3810	1136	6 - 17
				B	8,47	245,2	473,2	B	245,2	441,3	2336	3750	1330	6 - 21
				C	10,76	284,5	581,4	C	284,4	568,8	2239	3640	1690	6 - 21
800	120	2.564	641	A1	4,64	392,4	594,7	A1	392,2	588,4	4078	6410	1189	6 - 20
				A2	5,9	451,3	745,3	A2	451,1	676,6	3990	6320	1512	6 - 20
				A3	7,11	500,3	886,4	A3	500,1	750,2	3906	6220	1823	6 - 20
				B	8,52	539,6	1044,0	B	539,3	970,8	3809	6120	2184	6 - 24
				C	11,17	637,6	1311,0	C	637,4	1274,8	3625	5920	2863	6 - 24
1000 ⁽¹⁾	140	3.782	946	A1	4,71	735,8	1123,0	A1	735,5	1103,2	6009	9450	1782	6 - 23
				A2	5,58	804,4	1316,0	A2	804,1	1206,1	5921	9360	2111	6 - 23
				A3	6,82	912,3	1591,0	A3	912,0	1367,9	5794	9220	2580	6 - 23
				B	8,3	1030,0	1904,0	B	1029,6	1853,3	5643	9050	3139	6 - 24
				C	10,46	1177,0	2372,0	C	1176,7	2353,4	5422	8810	3956	6 - 24
1200 ⁽¹⁾	150	4.948	1.237	A1	4,8	1177,0	1816,0	A1	1176,7	1765,1	7850	12360	2375	6 - 24
				A2	6,11	1275,0	2284,0	A2	1274,8	1912,2	7675	12160	3023	6 - 24
				A3	7,14	1422,0	2640,0	A3	1421,9	2132,8	7538	12010	3533	6 - 24
				B	9,47	1668,0	3504,0	B	1667,0	3000,6	7226	11670	4686	6 - 24
				C	10,85	1962,0	3939,0	C	1961,2	3922,4	7041	11470	5369	6 - 24

Note : 1. Alternative Pile shoe available : Mamira shoe (close end) or cross fin shoe
 2. Pile handling calculation should be done when length exceed than standard
 3. Concrete compressive strength can be adjusted to meet require spesification

PRODUCT SHAPE

PC Square Piles



SPECIFICATION

Concrete Compressive Strength $f_c' = 42 \text{ MPa}$

Size (mm)	Cross Section (cm ²)	Unit Weight (kg/m)	Class	Prestress Steel	Bending Moment		Allowable Compression (kN)	Decompression Tension (kN)	Length of Pile* (m)	Splice Class	
					Crack (kN.m)	Ultimate (kN.m)				Compatible to Body Mccrack	Optional
200 x 200	400	100	A	B	11,0	20,0	514	147	6 - 9	-	-
			B	S/B	15,2	26,0	479	279	6 - 10	I	II
250 x 250	625	156	A	S/B	18,1	27,3	824	150	6 - 9	-	-
			B	S/B	21,1	33,9	805	222	6 - 10	III	IV
			C	S/B	24,2	42,5	786	291	6 - 10	II	-
			D	S/B	27,2	50,9	768	358	6 - 11	I	II
300 x 300	900	225	A	S/B	35,7	50,9	1.164	300	6 - 11	IV	V
			B	S/B	39,0	61,1	1.126	440	6 - 11	III	IV/V
			C	S/B	43,9	73,3	1.108	508	6 - 11	II	-
			D	S/B	48,2	91,6	1.091	573	6 - 12	I	III/IV/V
350 x 350	1.225	306	A	S/B	52,3	64,4	1.593	377	6 - 11	III	IV
			B	S/B	59,5	85,5	1.573	449	6 - 11	II	-
			C	S/B	65,0	106,9	1.554	519	6 - 12	I	IV
			D	S/B	71,6	128,3	1.536	589	6 - 12	I	III/IV
400 x 400	1.600	400	A	S/B	77,4	97,7	2.091	454	6 - 11	IV	V
			B	S/B	85,4	122,1	2.071	527	6 - 12	III	IV/V
			C	S/B	93,3	146,6	2.052	599	6 - 12	II	III/IV/V
			D	S/B	115,9	219,9	1.962	932	6 - 13	I	II/III/IV/V
450 x 450	2.025	506	A	S/B	109,5	137,4	2.638	606	6 - 12	III	V
			B	S/B	118,7	164,8	2.618	678	6 - 12	III	IV/V
			C	S/B	127,6	192,4	2.599	750	6 - 13	II	III/IV/V
			D	S/B	144,9	247,3	2.545	950	6 - 13	I	II/III/IV/V
500 x 500	2.500	625	A	S/B	148,7	183,2	3.294	611	6 - 12	III	IV
			B	S/B	158,8	213,6	3.254	758	6 - 12	II	IV
			C	S/B	168,8	244,3	3.229	848	6 - 13	I	III/IV
			D	S/B	178,7	274,8	3.198	963	6 - 14	I	II/III/IV

Note : • Prestressed steel : B = PC Bar , S = PC Strand

• Splice capacity with PC Bar heading connection compatible to pile body capacity

SPECIFICATION

Typical Splice

Size (mm)	Splice Class	Bending Moment		Tension	
		Crack (kN.m)	Ultimate (kN.m)	Allowable (kN)	Ultimate (kN.m)
200 x 200	I	16,1	21,8	442	497
	II	7,5	10,0	160	180
250 x 250	I	31,1	42,0	541	609
	II	29,3	39,5	406	457
	III	22,9	31,1	406	457
	IV	12,6	17,1	240	270
300 x 300	I	58,4	78,9	820	923
	II	44,4	60,0	615	692
	III	42,0	56,7	541	609
	IV	38,8	52,5	406	457
	V	22,9	31,0	240	270
350 x 350	I	75,2	101,5	820	923
	II	66,8	90,1	820	923
	III	56,0	75,6	541	609
	IV	32,4	43,6	271	305
400 x 400	I	119,6	161,5	1.157	1.301
	II	110,6	149,3	867	976
	III	92,3	124,6	820	923
	IV	84,1	113,6	615	692
	V	38,9	52,6	271	305
450 x 450	I	154,9	209,2	1.446	1.626
	II	138,0	186,3	1.157	1.301
	III	127,7	172,3	867	976
	IV	64,2	86,7	410	461
500 x 500	I	193,4	261,1	1.163	1.308
	II	161,9	218,6	1.157	1.300
	III	148,5	200,3	867	976
	IV	74,1	100,1	410	461

EXAMPLES OF PILES SPLICE SELECTION

Case 1: Compatible to Body Moment Crack

Splice of PC Piles having equivalent performance to the crack bending moment of the main body.



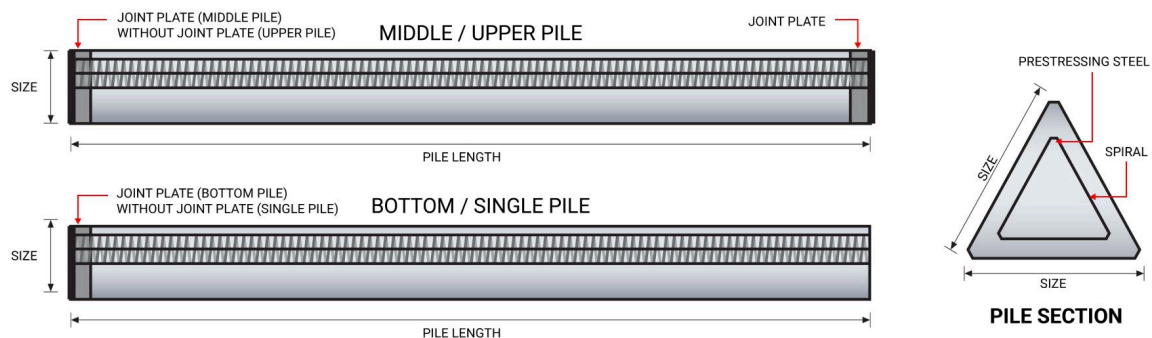
Case 2: Optional Splice

Application of optional splices should be approved by structure designer.



PRODUCT SHAPE

PC Triangular Piles



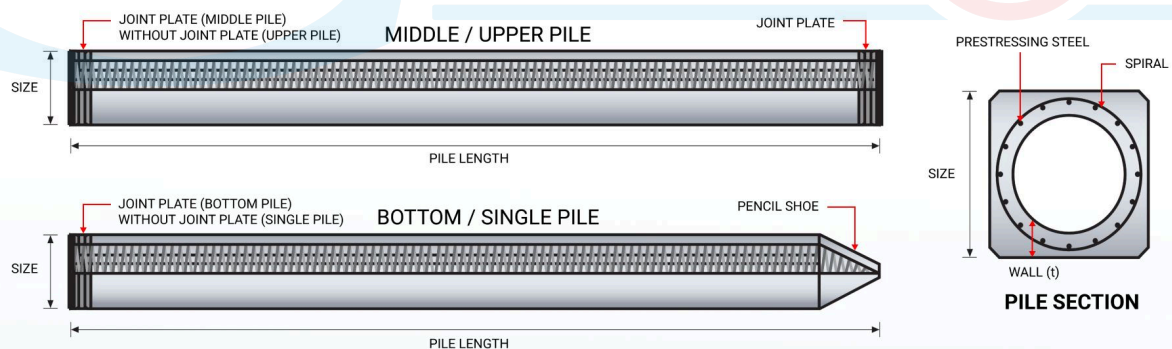
SPECIFICATION

Concrete Compressive Strength $f_c' = 42$ MPa

Size (mm)	Cross Section (cm ²)	Section inertia (cm ⁴)	Unit Weight (kg/m)	Class	Bending Moment		Allowable Compression (kN)	Decompression Tension (kN)	Length of Pile * (m)
					Crack (kN.m)	Ultimate (kN.m)			
280	318,7	9.080	79,7	A	6,5	9,0	414	269	6 - 8
				B	8,8	17,4	387	276	6 - 9
320	422,6	16.189	105,7	A	8,7	10,9	559	341	6 - 8
				B	11,8	21,1	531	405	6 - 9

PRODUCT SHAPE

PC Spun Square Piles



SPECIFICATION

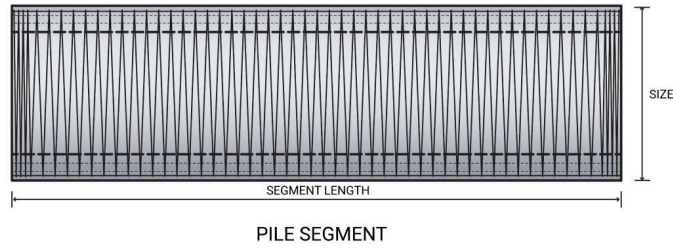
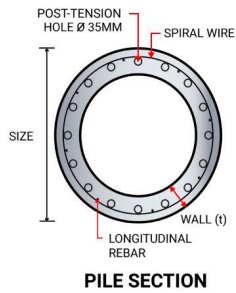
Concrete Compressive Strength $f_c' = 52$ MPa

Size (mm)	Thickness Wall (mm)	Cross Section (cm ²)	Section inertia (cm ⁴)	Unit Weight (kg/m)	Class	Bending Moment		Allowable Compression (kN)	Decompression Tension (kN)	Length of Pile* (m)
						Crack (kN.m)	Ultimate (kN.m)			
400 x 400	75	1.109	194.159	277	A2	63,7	98,1	1.791	373	6 - 13
					A3	78,4	117,7	1.771	425	6 - 14
					B	98,1	176,5	1.698	717	6 - 15
					C	107,9	215,7	1.662	899	6 - 16
450 x 450	80	1.365	307.000	341	A1	83,4	122,6	2.226	375	6 - 13
					A2	107,9	166,7	2.186	519	6 - 15
					A3	127,5	204,9	2.148	658	6 - 16
					B	132,4	235,3	2.111	793	6 - 16
					C	152,0	304,0	2.041	1.118	6 - 16

Note : *) Length of Pile may exceed usual standard whenever lifted in certain position

PRODUCT SHAPE

► PC Cylinder Piles



SPECIFICATION

Concrete Compressive Strength $f_c' = 52 \text{ MPa}$

Size (mm)	Thickness Wall (mm)	Cross Section (cm ²)	Section inertia (cm ⁴)	Unit Weight (kg/m)	Class	Bending Moment		Allowable Compression (kN)	Length of Pile (m) Single/Double***
						Crack (kN.m)	Break (kN.m)		
800	120	2.564	1.527.870	641	A	392	637	4.020	24 / 36
					B	539	784	3.824	24 / 36
					C	637	1.177	3.628	30 / 42
					D	735	1.275	3.481	30 / 42
1.000	140	3.782	3.589.517	946	A	735	1.079	5.884	24 / 36
					B	1.030	1.716	5.491	30 / 42
					C	1.177	2.157	5.393	30 / 48
					D	1.324	2.402	5.197	36 / 48
1.200	150	4.948	6.958.136	1.237	A	1.177	1.373	7.845	30 / 48
					B	1.667	2.648	7.305	36 / 48
					C	1.961	3.040	6.962	42 / 54
					D	2.059	3.138	6.864	42 / 60
1.500	170	7.103	15.962.533	1.776	A	2.157	2.599	11.179	36 / 48
					B	2.942	4.315	10.590	36 / 54
					C	3.334	5.099	10.198	42 / 60
					D	3.628	5.751	9.905	42 / 60
1.800	200	10.053	32.672.563	2.513	A	3.628	4.168	15.984	36 / 48
					B	4.609	6.374	15.493	36 / 54
					C	5.099	7.551	14.905	42 / 60
					D	5.786	7.747	17.357	40 / 60
2.000	200	11.309	46.369.907	2.827	A	4.707	5.246	17.945	35 / 55
					B	5.786	7.747	17.357	40 / 60
					C	6.570	9.463	16.866	45 / 65

PRODUCTION, PILE ASSEMBLING AND DISTRIBUTION PROCESS



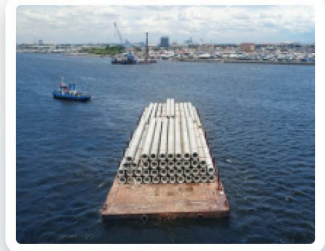
Segment Production



Stockyard Facility



Segment Assembly with Post-tensioning

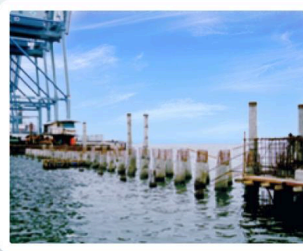


Pile Distribution

PRODUCT APPLICATION



Piles Foundation for Power Plant or Industrial Factory



Piles for Marine Structurer



Piles Foundation for Building



Piles Foundation for Bridges